

Subject: Cooling Meeting Minutes - November 13

Date: Wed, 14 Nov 2001 00:35:12 -0800

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Hi All,

Here are the minutes and action items from today's meeting.

Previous Agenda:

1. Irradiated demating testing (Tom W., Fred)
2. Luer developments (smaller size, mass, etc.) (me) (Fred - please also bring your tightening tool, so that we can work this into any new ideas)
3. Testing and fabrication plans (all)

Attendees:

Gil, Fred, Tom W., Neal

Minutes and Actions:


1. Irradiated Fitting Testing - Fred finished mating and demating the luer locks (Al/Al) 10 more times. This brings the total number of mate/demate cycles to 15. All fittings passed a VAC check after these cycles, and were sealed into the C3F8 container for irradiation. The fittings were immersed on thursday, and will complete 50 MRad at Livermore by this friday. After irradiation, the fittings will be tested through the first four stages of the testing regimen, which includes VAC, 0 C/4 bar, -35 C/1 bar, and VAC checks. These tests are to ascertain whether vacuum grease in the fittings was removed by the C3F8, and whether this potential removal affected the sealing in any way. After these tests, the fittings will be demated, with particular attention paid to any binding or sticking that may occur.
2. Luer Developments - Fred will work on the proposed lower mass luer lock design, similar to that which I have enclosed here (and which will be posted on my website tomorrow under fitting comparisons). Fred will design this fitting with lowest possible mass, while paying attention to how tools will be used to tighten the fitting without transmitting torque to the tubes. He will also incorporate a chamfer at the inner radius for laser welding, as has been suggested by EB Industries.
3. Indium Fittings - We have decided to approach the indium fitting design in a parallel effort with our European collaborators (in addition to the ongoing luer lock effort). This will allow us to make some indium fittings that fit the sector (rather than stave) and will allow us to delay sector production as little as possible (though it entails more work for us). Fred will work on the indium design along with the new luer design, taking into account the same torquing and assembly concerns. I have proposed a phone meeting for this friday with CERN, in order to discuss some indium questions with them that we may have. I will inform people when this meeting has been scheduled. Fred will not begin work on these new fittings until next week.
4. U-tube and Capillary Designs - I will make drawings of the remaining unknown designs for the sector


cooling circuit. These unknowns include the U-tube size and shape (beyond the obvious "U" nature) and the capillary size and fitting type. I have in my possession stock K&S tubing in almost perfect capillary size, most probably in the familiar 1060 alloy. I have attached a spreadsheet of all of the prototype tubing sizes that we are now designing to. I have also experimented with our aluminum capillary tubing, and it appears to be very robust (rebendable, non-crimping, etc.). I propose that we begin conducting "robustness" tests on the capillary tubing, which is 1/16" in diameter. These tests will include VAC testing, bending around a defined mandrel radius, unbending, rebending a number of times, and then repeat VAC and pressure testing. An additional test (not defined) will be needed to ascertain whether the inner capillary section decreases in size during bending and rebending (as this will have flow and pressure drop implications). We can use standard 1/16" swagelocks, and we have enough tubing for at least 10 test pieces (about 1' long each). Eventually we will need to laser weld these capillaries as well, but we should first determine that they are robust enough for use in the detector. I will also contact K&S in order to make sure that we can get capillary size tubing in long enough pieces for actual use.

5. Laser Welding - I am planning to visit EB Industries on the 30th of November. They will attempt to weld the last two variseal fittings to the sector tube (fully bent) that they now have. I will take with me 3 more bent tubes (action item on Jon W.) along with 6 "mock" fittings that Fred is now preparing for laser welding tests only (these will not be usable fittings). EB will then demonstrate for me the actual process that they will use for the sector production welding.

6. As always, please inform me of any other issues you think need discussion, or which I have simply missed or forgotten. Gil will not be at the Lab next Tuesday, but we will still have a cooling meeting (I will send a reminder on Monday). Thanks for all the great work.

Neal

 Fitting Comparisons - Diet Luer.pdf	Name: Fitting Comparisons - Diet Luer.pdf Type: Acrobat (application/pdf) Encoding: base64 Download Status: Not downloaded with message
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 Tubing Sizes Prototypes.xls	Name: Tubing Sizes Prototypes.xls Type: Microsoft Excel Worksheet (application/vnd.ms-excel) Encoding: base64 Download Status: Not downloaded with message
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